

REMARKS

I. Office Action Summary

A. Disposition of Claims

Claims 1-18 and 35-55 have been canceled. Claims 22, 24, 25 and 33 have been amended recite that the feeding stimulant is the compound of formula (I), which is the elected invention. These claims have also been amended to recite that the compound is used in an amount which is effective in stimulating feeding activity in termites. Support for these amendments can be found in the specification at page 5, lines 6-27, page 11, lines 27-30, page 11-1, lines 2-7, and page 12, lines 3-7. In claim 64, the term "catechol" has been amended to recite "1,2-dihydroxybenzene." As discussed in the prior response, the common name catechol is apparently applied to two different compounds. If one refers to the Merck Index, 12th Edition, the intended structure is given the name "pyrocatechol" with the synonym "catechol" being listed - it is entry 8183. The systematic name for the compound is 1,2-dihydroxybenzene, and it is within formula I recited in claim 9.

Accordingly, no question of new matter arises and entry of the Amendment is requested respectfully.

Claims 19-34 and 56-67 are pending. Claims 19-21 and 65-67 are withdrawn from consideration. Claims 22-34 and 56-64 are being examined. Of these, claims 22-27, 33, 34 and 56-64 are rejected and claims 28-32 are objected to.

B. Information Disclosure Statements

The Examiner initialed and returned the PTO Forms 1449 accompanying the Information Disclosure Statements filed on June 21, 2001 and September 6, 2002, but not all of the

references were initialed. At page 7 of the Office Action, the Examiner indicated that some of copies of the references listed in the IDS of June 21, 2003 were not available to him and asked for Applicants' cooperation to provide him with copies of AU-B-10625/83, Aldrich catalog, Kodak catalog, and Sigma catalog.

Submitted herewith are copies of the references identified by the Examiner, as well as, copies of PTO Forms 1449 submitted with the Information Disclosure Statements filed June 21, 2001 and September 6, 2002. The Examiner is requested to consider the references and indicate consideration thereof by initialing and signing the PTO Forms 1449.

II. Detailed Action

A. Election/Restriction

The claims have been amended to recite the compound of Formula (I) of claim 9, which is the elected invention.

B. Claim Objection - 37 C.F.R. § 1.75(c)

At page 3 of the Office Action, the Examiner objected to claims 28-32 as being of improper dependent form because they were multiply dependent claims which depended from claims which refer to multiple claims.

The claims have been amended to correct any improper multiple dependency.

C. Claim Rejections - 35 U.S.C. § 101

At page 4 of the Office Action, the Examiner rejected claims 39-46 because “use” claims are non-statutory subject matter

Claims 39-46 have been canceled. Thus, the rejection is moot.

D. Claim Rejections - 35 U.S.C. § 102(b)

Various claims were rejected under 35 U.S.C. § 102(b) as being anticipated by several references as discussed below in detail. The Examiner asserted that each of the cited references disclosed a composition for controlling termites and that the composition inherently has termite feeding stimulating activity. For the following reasons, the rejections are traversed, respectfully.

The Present Invention

Termite control strategies around the world for many decades have relied upon spraying with organochlorine compounds. With the ban on the use of organochlorines, bait systems for the control of active termite infestations are increasingly considered the key management option. However, currently used bait matrices do not necessarily ensure contact and build up of termite numbers in bait stations in a reliable and predictable fashion. Therefore, the identification and isolation of a natural feeding stimulant compound which is phylogenetically old and non-species specific for termites is a major advance in termite control.

Many aspects of insect behaviour are controlled by pheromones. Indeed, the earlier work of one of the inventors (Reinhard *et al.*, Journal of Chemical Ecology, Vol. 23, No. 10, 1997, which is admitted as prior art) concluded that the labial gland secretion may play a pheromonal role during food exploitation. The present inventors established that none of the principal labial

gland constituents (glucose, inositol and β -arbutin) elicited any feeding stimulation, except in unnaturally high concentrations where they probably served a nutritional role as food supplements. However, p-hydroquinone elicited feeding stimulation at natural trace levels in laboratory bioassays - see page 17 lines 1-7 of the present specification.

Pheromones act at extraordinarily low concentrations, with the threshold for attraction typically in the nanogram range or lower. In the present instance, the threshold for attraction for p-hydroquinone was found to be a concentration of approximately 50 picomoles for *M. darwiniensis* and 1 picomole for *C. acinaciformis* - see page 17 lines 7-10 of the present specification. Furthermore, other compounds of the invention were demonstrated to be attractive to various species of termites in amounts measurable in nanograms - see Table 3 on page 16. In field trials 20 μ g hydroquinone is dissolved in water and dispersed in a paper towel of some 10 gms in weight - see Example 5 - with increased feeding activity in several termite species demonstrated. Termite behaviour was also observed to be altered with minute quantities of p-hydroquinone (25ng-25 μ g) in sand-filled plastic arenas designed to enable observation of the termites as described in Example 3. In these experiments it was observed that the vapour of p-hydroquinone creates an "active space" of several centimetres which, once perceived, directs the termites towards the source of the vapour. Based on the concentrations of p-hydroquinone used, there may only be several hundred molecules present within the active space in the vapour phase, and the active space does not get larger with increased p-hydroquinone concentration. Indeed, too large a concentration of the compound overwhelms the termite's senses and, paradoxically, does not result in attraction. Accordingly, as would be well understood by one of ordinary skill in

the art, where a compound acts as a pheromone there is a concentration below which it cannot be detected and a concentration above which a response to the pheromone is no longer observed.

Pheromones are active at very low concentrations, the precise bounds of which may be established by routine experimentation and differ from compound to compound and, in this case, between termite species. Given that pheromone activity is manifested through stimulation of the senses, such as olfactory or gustatory stimulation, both upper and lower limits for the active range are significantly below the concentration ranges necessary for activity involving chemical reaction, such as toxicity.

JP 57-38339

The Examiner asserted that claims 1-5, 8-15, 17-18, 22, 35-38, 47-51, 54-61 and 63-64 are anticipated by JP 57-38339. In order to expedite examination of the application, claims 1-5, 8-15, 17-18, 35-38, 47-51, 54 and 55 have been cancelled. Claims 22, 56-61 and 63-64 remain pending.

Claim 22 defines a method of stimulating feeding activity in termites in which an amount of a feeding stimulant compound of general formula I effective in stimulating feeding activity in termites is applied to a locus. Claims 56-61 and 63-64 depend directly or indirectly from claim 22.

The compounds recited in JP 57-38339 are disclosed as the active constituent of termite controlling agents. The compounds cause abnormality in the antennae of the termites and, apparently, death of the termite. While acknowledging that there is no teaching or suggestion of the discovery of the present inventors that the compounds of the invention are a pheromonal

feeding stimulant, the Examiner asserts that because the same compounds are used, the same result must necessarily be obtained. In fact, a compound having toxicity for a termite would not be used at the natural trace levels at which the compounds of the present invention are effective, as discussed above. As such, use of the termiticidal compositions employed in JP 57-38339 does not generate conditions in which a termite would inevitably be attracted to a test compound. Conversely, there is no observation of toxic effects when the compounds referred to by the Examiner are used in pheromonal quantities able to stimulate feeding activity in termites.

In this respect, it is noted that the Japanese patent application discloses at column 5, lines 1-3 that the compounds may be incorporated into termite controlling compositions in an amount of between 0.1-20% by weight, preferably 1-10% by weight. These quantities are substantially above quantities in which the compounds of the present invention exhibit pheromonal activity as a feeding stimulant in termites and, for the reasons outlined above, the Examiner's assertion that the termite must respond in the same way to the same compound is not correct.

For inherency, the alleged characteristic must necessarily be present in the cited reference. That is not the case here. The amounts of the compounds used according to JP 57-38339 would not stimulate feeding activity, as recited in the amended claims.

Meyer *et al.*

All claims rejected by the Examiner have been canceled in order to expedite prosecution of the application. Nevertheless, Applicants note that Meyer *et al.* does not teach or suggest use of the compounds of the present invention as feeding stimulants for termites. Rather, this paper discusses the behaviour of the smaller European elm bark beetle and, in particular, its response to

stimulation with the compounds referred to by the Examiner. Termites and beetles are not closely related creatures in physiology or lifestyle and there is no reason to suppose that the observed effects in the smaller European elm bark beetle should correlate with activity in termites.

US 4,045, 554 (Springer *et al.*)

The Examiner rejected claims 1, 8-14, 16-18, 25-27 and 35-38 as anticipated by US 4,045,554. Claims 1, 8-14, 16-18 and 35-38 have been cancelled in order to expedite prosecution of the application, while claims 25-27 remain pending. Claims 26 and 27 depend both directly and indirectly from claim 25.

Claim 25 defines a bait for attracting termites comprising a food source and a feeding stimulant compound present in an amount effective to stimulate feeding activity in termites. In contrast, Springer *et al.* is concerned with the storage of wood chips, in particular, with chemical treatment to prevent chip deterioration resulting in tall oil loss during stockpiling. The difficulty in wood chip storage is that bacteria and fungi are present and active in the stockpile, and generate heat through respiration. Therefore, the proposal of Springer *et al.* is to apply phenols to kill or drastically inhibit the growth of bacteria and fungi on treated chips and to inhibit wood cell respiration. The phenols are applied together with sodium bisulfite in a combination treatment to enhance the effectiveness of the treatment. As will be appreciated by one of ordinary skill in the art, in order to disinfect a stockpile of wood chips the compounds are applied in substantial quantities - see, for example, column 3, lines 11-22 where 2.0% sodium bisulfite and 0.35% hydroquinone solutions are applied. The lower limit of effectiveness is calculated to be

0.5% sodium bisulfite and 0.05% phenol at column 6 lines 12. These quantities substantially exceed those at which the compounds of the present invention exhibit pheromonal activity to stimulate feeding in termites. Thus, the compositions of Springer *et al.* do not stimulate feeding activity as recited in the amended claims, and would not be useful as bait for attracting termites.

JP 3-112903

The Examiner rejected claims 1, 8-15, 17, 18, 22-26, 35-38, 47, 54-61, 63 & 64 as being anticipated by JP 3-112903. Claims 22-26, 47, 54-61, 63 & 64 remain pending. while the remaining claims have been cancelled to expedite prosecution of the application.

This abstract discloses a composition comprising hydroquinone or catechol but these compounds are included in the composition as stabilizing agents. The role of these compounds as antioxidants is well known, and in the manner used in the composition disclosed in JP 03-112903 they would act as an antioxidant and thereby serve to preserve the termite trail pheromone (3Z,6Z,E-dodecatrienol). The hydroquinone in the Japanese preparation is deliberately sacrificed over a protracted period by preferential oxidation (to benzoquinone) in order to preserve the integrity of the trail pheromone. which serves as the attractant for termites. In fact, any benzoquinone formed from this oxidation would be repellent to termites and would serve to counteract the attractiveness of the trail pheromone. Neither hydroquinone nor catechol was included in the Japanese preparation as a termite feeding stimulant or is described as such, as is presently claimed.

The contrast between the Japanese patent and the present invention is emphasized by the markedly different quantities of hydroquinone used in the two baits. Applicant's field trials (as

described at page 19) used a pheromone concentration of merely 20 μ g hydroquinone per 10 g of paper towel as bait matrix (that is 0.0002 % w/w). On the other hand, page 13, left lower column, lines 1-5 of JP 3-112903, states:

According to the present invention, the stabilizers can preferably be used in an amount of 1-10 wt% based on the amount of (3Z, 6Z, 8E)-dodecatrienol (formula I), and the synthetic resins can preferably be used in an amount of 20-1000 times (by weight) based on the amount of (3Z, 6Z, 8E)-dodecatrienol (formula I).

Thus, the very least amount of hydroquinone recommended for use as an antioxidant for the Japanese patent is fivefold greater (0.001 % w/w) but is generally far higher (up to 0.5% w/w) than this concentration. [See also the Abstract from esp@cenet, submitted herewith.] Such levels of hydroquinone are greatly in excess of the pheromonal quantities that stimulate feeding by individual termites (see pages 16-17) and, as typically observed with pheromones, the sensory response diminishes rapidly with increasing concentration above threshold.

Thus, for the termite trail pheromone preparation described in JP 03-112903, the presence of the attractive trail pheromone will direct the behaviour of the termites. As the hydroquinone is present at well above the level at which it excites a sensory response it will not modify the termites behaviour- over the range of hydroquinone concentrations that the authors employed. Moreover, since the authors had no reason to suspect that hydroquinone could be a termite pheromone, they had no motivation to carry out trials with their preparation in the absence of the trail pheromone. It is also to be noted that they incorporated hydroquinone in an inedible matrix (synthetic polymer resin, rather than an edible substrate such as paper or wood) and therefore

they would not, and could not have promoted any feeding stimulation even at the most dilute concentrations.

There is no suggestion in JP 03-112903 of a method of stimulating feeding activity in termites or of attracting termites to a locus through stimulation of feeding activity. Likewise, there is no suggestion of the exploitation of feeding stimulation in a bait for attracting termites. Moreover, as discussed above, while both hydroquinone and catechol are suggested for inclusion in a termite attractant in JP 03-112903, these compounds could not be responsible for attraction of termites to the bait nor for stimulation of feeding activity as recited in the amended claims.

DE 2149933

The Examiner rejected claims 1, 8-14, 17, 18, 25-27 and 33-38 as anticipated by DE 2149933. Only claims 25-27, 33 and 34 remain pending. While the Examiner only provided an English abstract, Applicants noted from the abstract supplied that there are both Australian and British equivalents of the German patent cited. As it was more convenient to obtain the British equivalent (GB 1359136 (Appln No. 47905/70)). Applicants did so and enclose a copy for the Examiner's consideration.

From a consideration of the abstract supplied it would appear that hydroquinone is likely applied as an antioxidant as discussed above in connection with JP 3-112903. The hydroquinone is mixed with an insecticide at a ratio of 31:70%, and 7-8 g of the resulting mixture is applied to 7.5 x 10 cm blotting paper. Further, the blotting paper appears to be coated with a layer of polymer which would likely render it inedible to termites. Therefore, tile coated blotting paper would seem to have hydroquinone present in quantities too high to stimulate feeding in termites

and, in any event, the materials used to coat the blotting paper render it unsuitable as a bait for termites. While it is unclear from the abstract why the polymer coating is applied, it is noted that the title of the application is "Insecticidal Material of Sustained Released Action," which suggests that the design of the product is intended to release insecticide into the atmosphere over a period of time in order to kill house flies and the like. The integrity of the insecticidal material would be preserved through inclusion of hydroquinone in the matrix, as hydroquinone will oxidise preferentially to most compounds and so be sacrificed to preserve the insecticidal material.

Accordingly, none of the references cited by the Examiner teaches a composition that necessarily contains a compound of the formula (I) in an amount that is effective in stimulating feeding activity in termites. Thus, the present invention is not inherent in the disclosure of the references, and the rejections should be removed.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Amendment Under 37 C.F.R. § 1.111
U.S. Appln. No.: 09/868,785

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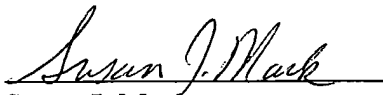
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